

Assessing the Resiliency of Lower Columbia River Wetlands to Climate Induced Sea Level Rise

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Tidal wetlands of the lower Columbia River provide a wide range of ecological and social services to local communities and ecosystems. Climate induced sea level rise is expected to raise water levels in the lower Columbia River, which in turn may impact the health of these wetlands. Tidal wetland areas may be lost, remain intact, or potentially migrate upslope, depending on their elevation relative to future water levels. Since the late 1800's more than 70% of tidal wetlands in the lower Columbia River have been lost due to various anthropogenic practices, severely limiting the amount of habitat available to juvenile salmon and other species. This extensive loss underscores the need to assess and plan for potential climate change effects on these habitats, given their importance. The Lower Columbia Estuary Partnership recently completed a baseline assessment of potential impacts to lower Columbia River tidal wetlands using GIS data and simulated hydraulic model water surface outputs for three sea level rise scenarios: a 0.5, 1.0, and 1.5-meter rise. For each scenario we compared land surface elevations from a high-resolution DEM to expected water levels predicted by the hydraulic model, to map and quantify potential changes in the distribution of wetlands. The study includes a coarse assessment of where levees may potentially overtop in response to sea level rise. Given the prevalence of leveed floodplain areas in the lower Columbia River, this response could influence the net balance between areas where existing tidal wetlands may be lost due to inundation and where they may be gained.